



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/577,085

05/24/2000

Larry Lee Clark

Cla*1/LUC288

5148

32205

7590

05/18/2004

PATTI & BRILL

ONE NORTH LASALLE STREET

44TH FLOOR

CHICAGO, IL 60602

EXAMINER

ZHEN, LI B

ART UNIT

PAPER NUMBER

2126

DATE MAILED: 05/18/2004

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/577,085

Applicant(s)

CLARK ET AL.

Examiner

Li B. Zhen

Art Unit

2126

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 and 27-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1 – 24 and 27 – 29 are pending in the application. Claims 25 and 26 are cancelled.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1 – 24 and 27 – 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant recites the limitations “throttling, independent of the at least one application and the provider” in claims 1, 9, 17, 21 and 27 – 29, and “without rejecting the stream of data” in claims 1, 9, 17, 21 and 27 – 29. There does not appear to be a written description of the claimed limitation in the application as filed.

As to “throttling independent of the at least one application and the provider,” applicant discloses throughout the specification that throttling is performed by an implementor in the transport layer provider [p. 11, line 16 – p. 12, line 1]. In addition claims 4, 12, 20, and 24 recite, “notifying the transport layer interface provider to throttle the plurality of streams of data.” According the specification, as best understood by the

examiner, the step of throttling is dependent on the transport layer provider because the transport layer provider performs the throttling process. Therefore, the applicant fails to disclose "throttling, independent of the at least one application and the provider" in the specification as filed.

As to "without rejecting the stream of data," applicant discloses in the specification that data flow can be disabled based on the individual and aggregate predetermined thresholds [p. 5, line 20 – p. 6, line 1]. Examiner interprets the data flow as data streaming and the specification suggest the data stream can be rejected [disabled] based on predetermined thresholds. Therefore, the applicant fails to disclose, "without rejecting the stream of data" in the specification as filed.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 – 24 and 27 – 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 1, 9, 17, 21 and 27 – 29 recite the limitation "the provider" in claim 1, line 9; claim 9, line 9; claim 17, line 12; claim 21, line 12; claim 27, line 15; claim 28, line 10; claim 29, lines 22 and 26. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1, 2, 4, 5, 7 – 10, 12, 13, 15 – 18, 20 – 22, 24, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent NO. 6,208,619 to Takeuchi in view of U.S. Patent NO. 6,108,305 to Charny.**

9. As to claim 1, Takeuchi teaches the invention substantially as claimed including a method of shared flow control of data [packet data flow control method; col. 4, lines 48 – 55] between a transport layer interface provider [ATM exchange 20 comprises switch 201, buffers 202-1, 202-2, 202-3, 202-4; col. 9, lines 29 – 38] and at least one application [sending terminal 10-1; col. 8, lines 10 – 16] comprising the steps of:

receiving from the at least one application a stream of data having a first aggregate downstream data rate [first packet exchange comprises copying means for copying data packets received from the upstream side to the number of the branch outputs, buffering means for storing the output of the copying means; col. 7, lines 1 – 13];

measuring the first downstream data rate [downstream transmission rate] of the stream of data [Transmission rate control processor 203 finds for these VP/Vcs the

transmission bandwidth that is capable of being received by each port from the downstream transmission rate; col. 10, lines 32 – 49];

transmitting the stream of data to the transport layer interface provider [communication data are transmitted from the sending terminal 10-1 in the order of the communication data 301-1, 301-2, 301-3 and 301-4; col. 14, lines 47 – 56]; and throttling [reduces the downstream transmission rate], independent of the at least one application and the provider [transmission rate control processor 203 reduces the downstream transmission rate], the stream of data from the first downstream data rate to a second downstream data rate [transmission rate control processor 203 reduces the downstream transmission rate by a bandwidth amount specified at the time of signaling, step 403, Fig. 4; col. 11, lines 5 – 19] without rejecting the stream of data [Examiner notes the transmission rate is reduced and data is not rejected].

10. Takeuchi transmitting a stream of data [col. 14, lines 47 – 56] but does not specify the stream of data is made up of a plurality of streams of data.

However, Charny teaches transmitting a stream of data that is made up of a plurality of streams of data [flows are organized into groups according to their rates....Once the set of discrete rates is chosen, all flows with a discrete rate $R(k)$ assigned to them are assigned to group $G(k)$; col. 5, line 43 – col. 6, line 27] and flow control of the aggregate streams [proportionally scale the rates down to link bandwidth, col. 9, lines 36 – 47; scheduling, by the scheduler, the first data flow and the second data flow such that the first flow rate and the second flow rate are less than an available bandwidth in the shared resource; col. 3, line 55 – col. 4, line 5].

11. It would have been obvious to apply the teaching of transmitting a stream of data that is made up of a plurality of streams of data as taught by Charny to the invention of Takeuchi because this allows multiple pairs of applications to stream data to each other concurrently and provide efficient utilization of system bandwidth.

12. As to claim 2, Takeuchi as modified teaches counting with an aggregate downstream counter an amount of received data from the stream of data [number of packets stored in the buffering means; col. 7, lines 1 – 30 of Takeuchi].

13. As to claim 4, Takeuchi as modified teaches comparing the aggregate upstream counter to a predetermined downstream aggregate threshold [calculates upstream transmission bandwidths absorbable up to the next rate control cycle...checks the current upstream transmission bandwidths...and judges whether the difference between the upstream transmission bandwidth and the downstream bandwidth obtained from the transmission rate management table 2040 is in an absorbable range; col. 11, lines 3 – 20 of Takeuchi] and notifying the transport layer interface provider to throttle the plurality of streams of data [transmission rate control processor 203 reduces the downstream transmission rate by a bandwidth amount specified at the time of signaling, step 403, Fig. 4; col. 11, lines 5 – 19 of Takeuchi].

14. As to claim 5, Takeuchi as modified teaches identifying an individual upstream stream of data from the plurality of streams of data [flows are organized into groups

according to their rates. A predetermined set of discrete rates $R(1), R(2), \dots R(n)$ is chosen according to some rule....Once the set of discrete rates is chosen, all flows with a discrete rate $R(k)$ assigned to them are assigned to group $G(k)$; col. 5, lines 40 - 67 of Charny], and counting from the individual upstream stream of data an individual amount of received data with an individual upstream counter associated with the individual downstream stream of data [n flows indexed by integers 1,2, . . . n sharing a slotted link (any switch or adapter) of capacity C...each flow i is assigned a rate $R(i)$; col. 6, lines 9 – 40 of Charny].

15. As to claim 7, Takeuchi as modified teaches comparing the individual upstream counter to a predetermined upstream individual threshold [assigned flow rates constitute the maximum allowed rate...scaling the rates up may not be allowed, while scaling the rates down can be either desirable or acceptable; col. 9, lines 33 - 50 of Charny].

16. As to claim 8, Takeuchi as modified teaches executing UNIX stream functions to throttle the stream of data [transmission rate control processor 203 reduces the downstream transmission rate by a bandwidth amount specified at the time of signaling, step 403, Fig. 4; col. 11, lines 5 – 19 of Takeuchi].

17. As to claim 9, Takeuchi as modified teaches shared flow control of data [packet data flow control method; col. 4, lines 48 – 55 of Takeuchi] between a transport layer interface provider [ATM exchange 20 comprises switch 201, buffers 202-1, 202-2, 202-

3, 202-4; col. 9, lines 29 – 38 of Takeuchi] and at least one application [sending terminal 10-1; col. 8, lines 10 – 16 of Takeuchi] comprising the steps of:

receiving from the transport layer interface provider a stream of data having a first aggregate upstream data rate [first packet exchange comprises copying means for copying data packets received from the upstream side to the number of the branch outputs, buffering means for storing the output of the copying means; col. 7, lines 1 – 13 of Takeuchi];

measuring the first aggregate upstream data rate of the stream of data [calculates upstream transmission bandwidths absorbable up to the next rate control cycle for each port, step 405, Fig. 4; col. 11, lines 3 – 19 of Takeuchi];

transmitting the stream of data to the at least one application [communication data are transmitted from the sending terminal 10-1 in the order of the communication data 301-1, 301-2, 301-3 and 301-4; col. 14, lines 47 – 56 of Takeuchi]; and

throttling, independent of the at least one application and the provider, the stream of data from the first aggregate upstream data rate to a second aggregate upstream data rate without rejecting the stream of data [the obtained maximum allowable transmission bandwidth is notified to the upstream by the congestion notification cell 50 (step 510), and contents of the transmission rate management table 2040 are updated in accordance with the upstream transmission rate (step 512); col. 12, lines 40 – 50 of Takeuchi]. As to aggregate stream, see the rejection to claim 1 above.

Art Unit: 2126

18. As to claims 10, 12, 13, 15 and 16, these are rejected for the same reasons as claims 2, 4, 5, 7 and 8 above.

19. As to claims 17, 18 and 20, these are product claims that correspond to method claims 1, 2 and 4; note the rejection to claims 1, 2 and 4 above, which also meet these product claims.

20. As to claims 21, 22 and 24, these are product claims that correspond to method claims 9, 10 and 12; note the rejections to claims 9, 10 and 12 above, which also meet these product claims.

21. As to claim 27, Takeuchi as modified teaches shared flow control of data streams [packet data flow control method; col. 4, lines 48 – 55], flowing in both upstream and downstream directions [upstream link and downstream link; col. 4, lines 50 – 67 of Takeuchi], between a transport layer interface provider [ATM exchange 20 comprises switch 201, buffers 202-1, 202-2, 202-3, 202-4; col. 9, lines 29 – 38 of Takeuchi] and at least one application [sending terminal 10-1; col. 8, lines 10 – 16 of Takeuchi], comprising the steps of:

passing a plurality of data streams [first packet exchange comprises copying means for copying data packets received from the upstream side to the number of the branch outputs, buffering means for storing the output of the copying means; col. 7, lines 1 – 13 of Takeuchi] through a flow control module [Transmission rate control

Art Unit: 2126

processor 203; col. 10, lines 32 – 49 of Takeuchi] that is located between the at least one application and the provider, an aggregate data stream being formed by the plurality of data streams [flows are organized into groups according to their rates....Once the set of discrete rates is chosen, all flows with a discrete rate $R(k)$ assigned to them are assigned to group $G(k)$; col. 5, line 43 – col. 6, line 27 of Charny];

calculating, in the flow control module that has upstream [calculates upstream transmission bandwidths absorbable up to the next rate control cycle for each port, step 405, Fig. 4; col. 11, lines 3 – 19 of Takeuchi] and downstream [Transmission rate control processor 203 finds for these VP/Vcs the transmission bandwidth that is capable of being received by each port from the downstream transmission rate; col. 10, lines 32 – 49 of Takeuchi] aggregate counters, an aggregate data rate for the aggregate data stream from the plurality of data streams in a respective one of the upstream and downstream directions [flows are organized into groups according to their rates. A predetermined set of discrete rates $R(1), R(2), \dots R(n)$ is chosen according to some rule....Once the set of discrete rates is chosen, all flows with a discrete rate $R(k)$ assigned to them are assigned to group $G(k)$; col. 5, lines 40 - 67 of Charny];

comparing, in the flow control module that has a comparator, at least one of the upstream and downstream aggregate counters to the aggregate data rate threshold to determine if the aggregate data rate threshold has been exceeded by the aggregate data rate of the aggregate data stream [calculates upstream transmission bandwidths absorbable up to the next rate control cycle...checks the current upstream transmission bandwidths...and judges whether the difference between the upstream transmission

bandwidth and the downstream bandwidth obtained from the transmission rate management table 2040 is in an absorbable range; col. 11, lines 3 – 20 of Takeuchi];
and

throttling [reduces the downstream transmission rate], if the aggregate data rate threshold has been exceeded by the aggregate data rate of the aggregate data stream and independent of the at least one application and the provider [transmission rate control processor 203 reduces the downstream transmission rate], all of the data streams in the plurality of data streams from the aggregate data rate to another aggregate data rate [transmission rate control processor 203 reduces the downstream transmission rate by a bandwidth amount specified at the time of signaling, step 403, Fig. 4; col. 11, lines 5 – 19 of Takeuchi] without rejecting the plurality of data streams [Examiner notes the transmission rate is reduced and data is not rejected].

22. As to claim 28, Takeuchi as modified teaches calculating, in the flow control module that has upstream [calculates upstream transmission bandwidths absorbable up to the next rate control cycle for each port, step 405, Fig. 4; col. 11, lines 3 – 19 of Takeuchi] and downstream individual counters [Transmission rate control processor 203 finds for these VP/Vcs the transmission bandwidth that is capable of being received by each port from the downstream transmission rate; col. 10, lines 32 – 49 of Takeuchi], a respective individual data rate for each data stream in the plurality of data streams [flows are organized into groups according to their rates. A predetermined set of discrete rates $R(1)$, $R(2)$, . . . $R(n)$ is chosen according to some rule....Once the set of

discrete rates is chosen, all flows with a discrete rate $R(k)$ assigned to them are assigned to group $G(k)$; col. 5, lines 40 - 67 of Charny];

comparing, in the flow control module, at least one of the upstream and downstream individual counters to the respective individual data rate threshold to determine if the respective individual data rate threshold has been exceeded by the respective individual data rate of a respective data stream of the plurality of data streams [calculates upstream transmission bandwidths absorbable up to the next rate control cycle...checks the current upstream transmission bandwidths...and judges whether the difference between the upstream transmission bandwidth and the downstream bandwidth obtained from the transmission rate management table 2040 is in an absorbable range; col. 11, lines 3 – 20 of Takeuchi]; and

throttling [reduces the downstream transmission rate], if the respective individual data rate threshold has been exceeded by the respective individual data rate and independent of the at least one application and the provider [transmission rate control processor 203 reduces the downstream transmission rate], the respective individual data stream from the respective individual data rate to a further individual data rate [transmission rate control processor 203 reduces the downstream transmission rate by a bandwidth amount specified at the time of signaling, step 403, Fig. 4; col. 11, lines 5 – 19 of Takeuchi] without rejecting the plurality of data streams [Examiner notes the transmission rate is reduced and data is not rejected].

23. Claims 3, 6, 11, 14, 19, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi and Charny further in view of U.S. Patent No. 5,418,912 to Christenson [cited in previous office action].

24. As to claims 3, 11, 19, and 23, Takeuchi as modified teaches counting the amount of received data [col. 7, lines 1 – 30 of Takeuchi] but does not specify incrementing and decrementing a counter.

However, Christenson teaches [column 5, lines 5 – 15 and 33 – 51; column 5, line 52 – column 6, line 10] controlling data transmission [session layer 24 is provided with a control mechanism for limiting the amount of data which may be sent to the data link control layer 28, Fig. 2] and counting amount of received data with a counter [flood control counter FCC...is used to count session packets], incrementing [FCC is incremented] and decrementing [decrements the FCC] the counter.

25. It would have been obvious to a person of ordinarily skilled in the art at the time of the invention to apply the teaching of incrementing and decrementing a counter to represent the amount of received data as taught by Christenson to the invention of Takeuchi as modified because this would dynamically measure the amount of data being transferred and this information is used to make flow control decisions and prevent problems such as buffer overflow.

26. As to claims 6 and 14, Takeuchi as modified teaches counting an individual amount of received data [number of packets stored in the buffering means; col. 7, lines

1 – 30 of Takeuchi]. As to incrementing and decrementing a counter, see the rejection to claims 3 and 11 above.

Conclusion

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent NO. 6,292,834 to Ravi teaches dynamic bandwidth selection for efficient transmission of multimedia streams in a computer network.

U.S. Patent NO. 6,130,878 to Charny teaches a method and apparatus for rate-based scheduling for scheduling flows in computer networks.

U.S. Patent NO. 6,222,856 to Krishnan teaches bandwidth throttling system implemented on a server network.

U.S. Patent NO. 5,799,002 to Krishnan teaches adaptive bandwidth throttling for network services.

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li B. Zhen whose telephone number is (703) 305-3406. The examiner can normally be reached on Mon - Fri, 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (703) 305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Li B. Zhen
Examiner
Art Unit 2126

lbz
May 13, 2004


MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100